EQUIPMENT INSTALLATION MANUAL

For the

GEN-X Electronic Flight Bag

P/N 1069-4000-01, RPU
P/N 1069-48XX-XX, DU

RELEASED

Rev D

DAC International
6702 McNeil Drive
Austin, TX 78729

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RECORD OF REVISIONS

REV	DESCRIPTION	DATE	APPROVED
IR	Initial Release E633	11-21-06	LW
A	Added Typical Ethernet Interconnections, Battery Checkout & Maintenance E709	4/30/06	LW
B	Clarified Ground Names and Connections E713	5/3/07	LW
C	Updated as per ECO E726-06	5/23/07	LW
D	Add Optional Non-terminated Display Cable E748	07/25/07	BH

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INTRODUCTION:

This manual contains installation data, specifications and Instructions for Continued Airworthiness for the DAC International GEN-X Electronic Flight Bag (EFB), consisting of Part Number 1069-4000-01, Remote Processor Unit (RPU) and 1069-48XX-XX, Display Unit (DU).

DESCRIPTION:

The DAC International GEN-X is designed to be a robust electronic flight bag. The GEN-X system may be used with any software which can run under Windows XP Professional®. It may include DAC International Software called GENESYS ©.

PART NUMBERS:

GEN-X RPU:

1069-4000-01	Electronic Flight Bag Remote Processor Unit

PART NUMBERS:

Gen-X RPU Mount:

1069-6001-01 Electronic Flight Bag Remote Processor Unit Mount

Gen-X DU:

1069-48XX-XX Electronic Flight Bag Display Unit

```
          |    | |
          |    | \___ First digit is the color code of the display
          |    |        01 = Grey, 02 = Black, 03 = Brown
          |    |
          |    \____ Second digit is the resolution capability of the display
          |          0 = 800 X 600, 1 = 1024 X 768
          |
           \ ______Third and fourth digits represent display size
                    08 = 8", 10 = 10", 12 = 12"
```

Gen-X Display Cable:

1069-4700-XX Electronic Flight Bag Display Cable

```
              |
              \___Last 2 digits specify straight or right angle RPU mating connector
                   01 = Straight, 02 = Right Angle
```

REGULATORY COMPLIANCE:

Software

The software was developed in accordance with RTCA/DO-178B to criticality level E in accordance with FAA Advisory Circular AC 120-76A for Type B software.

Hardware

The GEN-X hardware was developed as a Class 3 EFB in accordance with FAA Advisory Circular AC 120-76A.

INSTALLATION KIT:

Installation kits are available under kit part number 1069-4200-01. Individual pieces are available under the part numbers shown. Contact DAC International sales to place orders.

Part Number	Description	Qty
1069-4200-01	Installation Kit, GEN-X	
P10440	Connector, J2 Mate, Cable End, Straight (Includes Backshell)	1
1069-2510-01	Equipment Installation Manual for GEN-X	1

A right angle connector which mates with J2 is also available for purchase separately.

Part Number	Description	Qty
P10512	Connector, J2 Mate, Cable End, Right Angle (Includes Backshell)	1

An Optional 16 foot non-terminated Gen-X Display Cable is also available for purchase for installations that may require a shorter cable run.

Part Number	Description	Qty
1069-4701-01	16’ Gen-X Display Cable, non-terminated RPU end	1

NON-SUPPLIED EQUIPMENT:

Single Wire : MIL-W-22759/16, or equiv.
Shielded Wire : MIL-C-27500 or equiv.
Ethernet Wire : PIC Wire & Cable PN E10424 or equiv.

SPECIFICATIONS:

Physical:

The GEN-X RPU attaches to its mount through two .25” guide pins and a two lock turn wing nuts. The mount is attached to the airframe via four mounting holes. See the paragraph titled Outline Drawing for further details.

RPU

Height.....2.655” (Includes mounting flange)
Width.....8.561” (Includes mounting flange)
Depth.....12.810” (Includes mounting flange)
Weight.....7.8 lb. (Includes mounting flange)

DU 8”

Height.....9.90”
Width.....6.90”
Depth.....1.705”
Weight……3.4 lb.

DU 10”

Height.....11.60”
Width.....8.13”
Depth.....1.705”
Weight……4.6 lb.

DU 12”

Height.....13.00”
Width.....9.20”
Depth.....1.76”
Weight……5.6 lb.

Electrical:

Emergency Buss (Monitored only)
Input Voltage .....28 VDC Nominal (10Vdc – 32Vdc operational)
Input Current.....0.001 Amp at 28 VDC
Essential Buss
Input Voltage .....28 VDC Nominal (10Vdc – 32Vdc operational)
Input Current.....3.1 Amp at 28 VDC

Data Input:

ARINC 429
Baud Rate.....Auto Sensing
Supported ARINC Data Labels

ARINC 429 ==========	743 BNR	429 BNR	BCD
Date			260
Time	150		125
Latitude	110	310	010
Longitude	111	311	011
Altitude	370	076,	203, 204
Ground Speed	112	312 (012)	
Heading	314, 320	014,	044
Track Angle	103	313	013
ETA / Time to go	252	056	
Distance to Go	351*		
Time to Destination	352*		
Destination Waypoint (GAMA)	074* 075*		
(decode last wpt only)	113* 300 - 307*		
Destination Waypoint .	061, 062, 063		

* indicates GAMA label

Reliability:

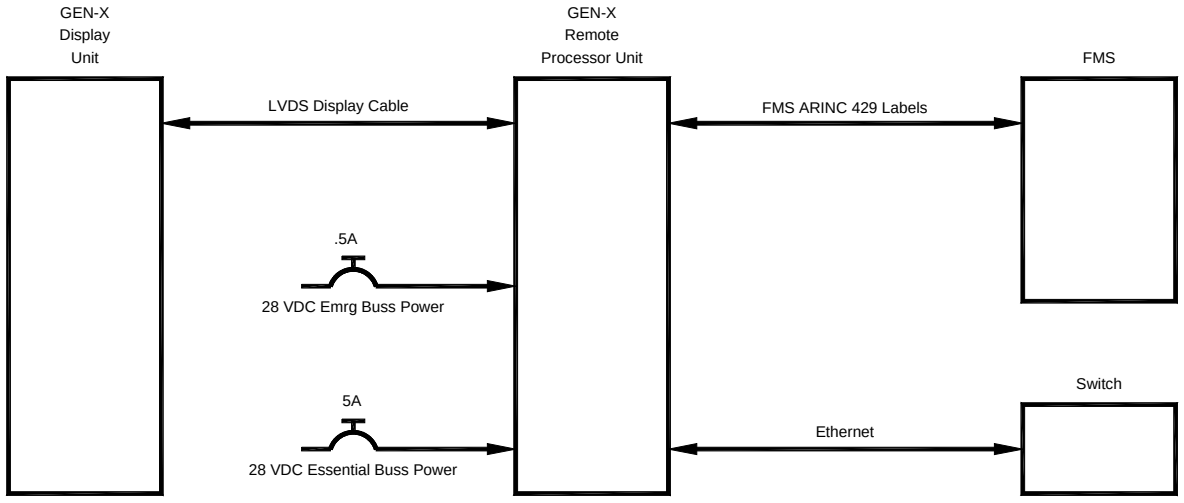
MTBF.....Greater than 10,000 hours.

OPERATION:

The GEN-X System is a Windows based PC system which consists of a Remote Processor Unit and a Display Unit which are connected thru an LVDS cable. Inputs to the RPU include FMS data and Ethernet connectivity to a switch which will in turn allow communications to the second EFB, cameras and aircraft LAN or server systems.

On-Off function is controlled through the power input logic described below.

	Emergency Buss	Essential Buss	
System powers up using Essential Buss and charges internal battery	On	On	This is normal turn on sequence
System goes to internal Battery.	On	OFF	This assumes power loss emergency. Battery power 45 mins minimum at max battery life.
System performs normal shutdown down using internal battery	OFF	OFF	This is the normal shutdown sequence
System remains powered on Essential Buss	OFF	ON	This is an unexpected logic and unit remains on through essential buss power.



REMOVAL AND REPLACEMENT:

RPU Removal

1. Power down the GEN-X by opening its **two** RPU circuit breakers and wait approximately one minute for the system to power down.
2. Verify that the three RPU annunciators located on the connector side of the RPU are extinguished.
3. Remove the two connectors by twisting counterclockwise one quarter turn, then pulling the connector free.
4. Remove safety pin clip from front of mount by pulling sharply.
5. Twist the thumb screws on the RPU counterclockwise one quarter turn and pull up, then forward to remove rear guide pins from mount bracket.

RPU Installment

1. Open the two circuit breakers powering GEN-X.
2. Insert the RPU guide pins into the holes in the rear of the mount bracket
3. Seat RPU mounting hole (located on flange near handle) over mount guide pin. Once units have been fully mated twist thumbscrews (2) clockwise until positive lock is achieved. Insert safety pin clip through mount guide pin to secure.
4. Close the two circuit breakers.
5. Perform operational test of the GEN-X as prescribed in the aircraft maintenance manual.

DU Removal

1. Power down the GEN-X by opening its **two** RPU circuit breakers and wait approximately one minute for the system to power down.
2. Verify that the three RPU annunciators located on the connector side of the RPU are extinguished.
3. Remove the safety pin on rear of mount.
4. Twist off retaining nut being careful to capture the washer and spring on rear of mount.
5. Pull DU straight off mount and disconnect the connector by pulling the locking ring away from the connector body.
6. Remove and retain four screws and mount stud assembly from DU body.

DU Replacement

1. Attach mount stud body with four screws making sure to select the appropriate set of mounting holes on the display unit that will be nearest to the aircraft window.
2. Align red dots on DU connector and cable connector. Push together and verify positive lock.
3. Perform operational test of the GEN-X as prescribed in the aircraft maintenance manual.

Battery Replacement

1. Remove RPU according to section “RPU Removal”.
2. Locate and remove the RPU battery cover by removing the two screws holding it to the RPU housing.
3. Remove battery by pulling on cloth tab.
4. Install new battery observing correct orientation.
5. Reinstall battery cover.
6. Reinstall RPU according to section “RPU ”.
7. Close GEN-X system circuit breakers.
8. Verify battery condition light is off.

Battery Checkout

The lithium ion battery installed in the Gen-X RPU is incased in a smart electronic package which eliminates the risk of overcharging during temperature extremes as well as monitoring the age and condition of the battery itself. When a condition exists that causes the battery to be incapable of performing its intended function, the battery monitor light on the RPU is lit yellow. If during normal inspection intervals this yellow light is observed, the battery should be replaced according to the section "Battery Replacement".

Equipment Checkout

The GEN-X Electronic Flight Bag is used to display user-selected software that may perform a variety of tasks in the cockpit. Refer to the pilots guide or Aircraft maintenance manual for actual tests.

1. Apply power to both the battery buss circuit breaker and the essential buss breaker.

   System will initiate.
2. Insure operation of dimming and screen on-off control.
3. Insure operation of EFB touch screen.
4. Perform the functional test of the GEN-X Electronic Flight Bag.

Note: FMS operation is not a functional requirement for operation.

CONTINUED AIRWORTHINESS:

This section provides data intended to assist the installer with establishing Instructions for Continued Airworthiness as required by FARs 23.1529, 25.1529, 27.1529 and 29.1529.

1. Maintenance Manual information for the GEN-X includes a system description, removal instructions, installation instructions and functional testing, which are all contained in the DAC International Installation Manual, 1069-2510-01 (this document).

2. Line replaceable unit (LRU) part numbers and other parts contained in the installation data package should be placed in the aircraft operator's appropriate airplane Illustrated Parts Catalog (IPC).

3. Wiring diagram information contained in the installation data package should be placed in the aircraft operator's appropriate airplane Wiring Diagram Manual.

4. Scheduled Maintenance Program tasks are as follows:

    a. Recommended Periodic Scheduled Servicing ..... Battery Replacement

    b. Recommended Periodic Scheduled Preventive Maintenance Tests..... With normal power applied to the Essential and Emergency busses, check the three indicator lamps on the RPU. The Essential buss light and Emergency buss light are lit green and the Battery light is off. If the Battery light is lit yellow the battery must be replaced. The battery is good for three years and is on condition.

    c. Recommended Periodic Inspections ..... Battery status indicator lamp inspection recommended every 300 hours. Or, operators performing scheduled maintenance under a CAMP (Continuous Airworthiness Maintenance Program) shall determine a suitable interval for internal battery checks and replacement.

    d. Recommended Periodic Overhaul Period ..... None Required

    e. Special Inspection Requirements ..... None Required

5. Application of Protective Treatments ..... None Required

6. Special Tools..... None Required

7. Electrical loads for this appliance are as specified in the DAC International Installation Manual, 1069-2510-01 (this manual).

8. There are no airworthiness limitations associated with the installation of this appliance.

ENVIRONMENTAL:

The GEN-X meets the environmental test categories detailed below in accordance with RTCA/DO-160E, Environmental Conditions and Test Procedures for Airborne Equipment and 14 CFR 25.869 Code of Federal Regulations: Title 14 Aeronautics and Space; Subpart D – Design and Construction; Subsection 25.869 (a)(4) – Fire Protection Systems.

NOMENCLATURE: GEN-X Electronic Flight Bag
PART NO: 1069-4000-01, 1069-4808-XX and 1069-4700-XX
MANUFACTURER: DAC International
ADDRESS: 6702 McNeil Drive, Austin, TX 78729

Standard/Section	Category	Remarks
DO-160E		
4.0 Temperature and Altitude	A4	Temperature: Category A4, Operating Low temp; -15ºC and Operating High temp; +55ºC, Short time Operating Low temp; -30ºC and Short time Operating High temp; +55ºC, Ground Survival Low temp; -55ºC and Ground Survival High Temp; +85ºC. Altitude: Category A1, Altitude at 50,000 feet for 2 hours, Decompression from 8,000 feet to 50,000 feet within 15 sec., Overpressure at -15,000 feet for 10 minutes.
5.0 Temperature Variation	B	5° C per minute
6.0 Humidity	X	Not tested
7.0 Operational Shock and Crash Safety	B	Saw-tooth 6g, 11msec, 3 shocks per direction. Saw-tooth 20g 11msec, 3 shocks per direction.
8.0 Vibration	X	Not tested
9.0 Explosion Proofness	X	Not tested
10.0 Waterproofness	X	Not tested
11.0 Fluids Susceptibility	X	Not tested
12.0 Sand and Dust	X	Not tested
13.0 Fungus Resistance	X	Not tested
14.0 Salt Spray	X	Not tested
15.0 Magnetic Effect	Z	Less than 0.3 meter
16.0 Power Input	X	Not tested
17.0 Voltage Spike	X	Not tested

Standard/Section	Category	Remarks
DO-160E (cont'd)		
18.0 AF Conducted Susceptibility – Power Inputs	X	Not tested
19.0 Induced Signal Susceptibility	X	Not tested
20.0 Radio Frequency Susceptibility (Radiated and Conducted)	(1)	Not tested
21.0 Emission of Radio Frequency Energy	M	Cockpit Equipment
22.0 Lightning Induced Transient Susceptibility	(1)	Not tested
23.0 Lightning Direct Effects	X	Not tested
24.0 Icing	X	Not tested
25.0 ESD	X	Not tested
Code of Federal Regulations		
14 CFR 25.869	N/A	Fire Protection Systems

Notes:

(1) – Compliance to be shown by analysis only where applicable to critical aircraft equipment.

CONNECTOR PIN OUT:

The GEN-X RPU contains three male connectors,

J1 (Note: The mate for this connector is normally part of pre-made interface cable P/N 1069-4700-XX)

Pin	Signal	Function
A	Power Common	Power Common
B	Aircraft Common	Chassis Ground
C	DA 0 (-)	LVDS Data 0 (-)
D	DA 0 (+)	LVDS Data 0 (+)
E	DA 1 (-)	LVDS Data 1 (-)
F	DA 1 (+)	LVDS Data 1 (+)
G	DA2 (-)	LVDS Data 2 (-)
H	DA2(+)	LVDS Data 2 (+)
J	CLK -	LVDS CLK (-)
K	CLK +	LVDS CLK (+)
L	LED 3	Emergency Operation warning light
M	USB D0(-)	USB Data 0 (-)
N	USB D0(+)	USB Data 0 (+)
P	COM 2 TX	RS232 COM 2 TX (Touch Screen)
R	COM 2 RX	RS232 COM 2 RX (Touch Screen)
S	VMC 10 V +	VMC10 in system Pwr +
T	VMC 10 V-	VMC10 in system Pwr -
U	Power Ground	Power Ground
V	Power Ground	Power Ground

J2 Standard Inputs

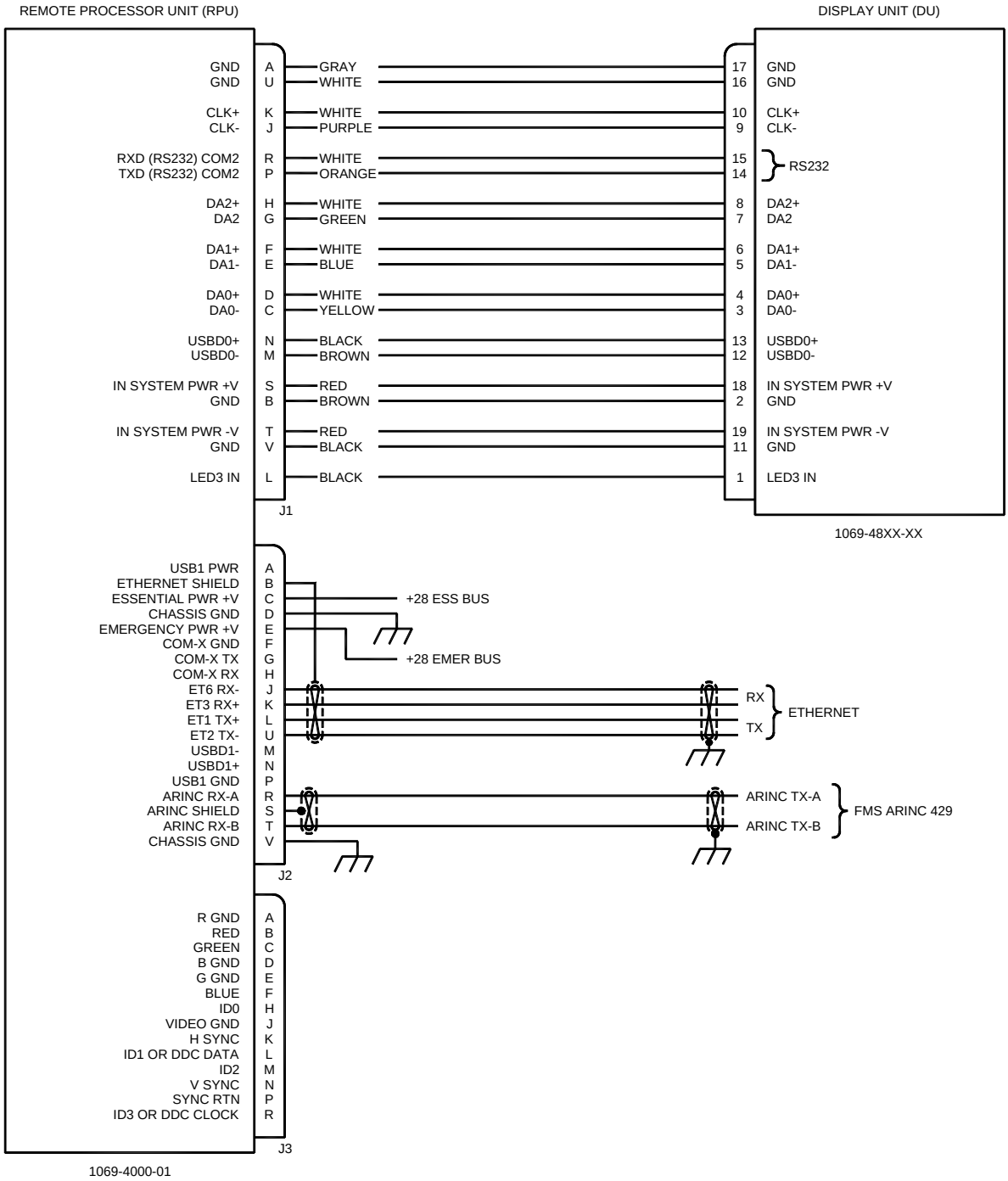
Pin	Signal	Function
A	USB A+	USB 1 Power
B	Ethernet Ground	Ethernet Shield
C	A+ (Ess)	28 VDC Power from Essential Buss
D	A- (Emer)	Power Common (Emer)
E	A+ (Emer)	28 VDC Emergency Buss Monitor
F	Com 2 Common	RS-232 Bus Common
G	Com 1 TX	RS 232 TX
H	Com 1 RX	RS 232 RX
J	ET 6	Ethernet wire 6 (Rx-)
K	ET3	Ethernet wire 3 (Rx+)
L	ET1	Ethernet wire 1 (Tx+)

M	USB D1-	USB Data 1(-)
N	USB D1+	USB Data 1(+)
P	USB Common	USB Common
R	ARINC RX (A)	429 RX (A)
S	ARINC Shield	ARINC Shield
T	ARINC RX (B)	429 RX (B)
U	ET2	Ethernet wire 2 (Tx-)
V	Power Common	Power Common

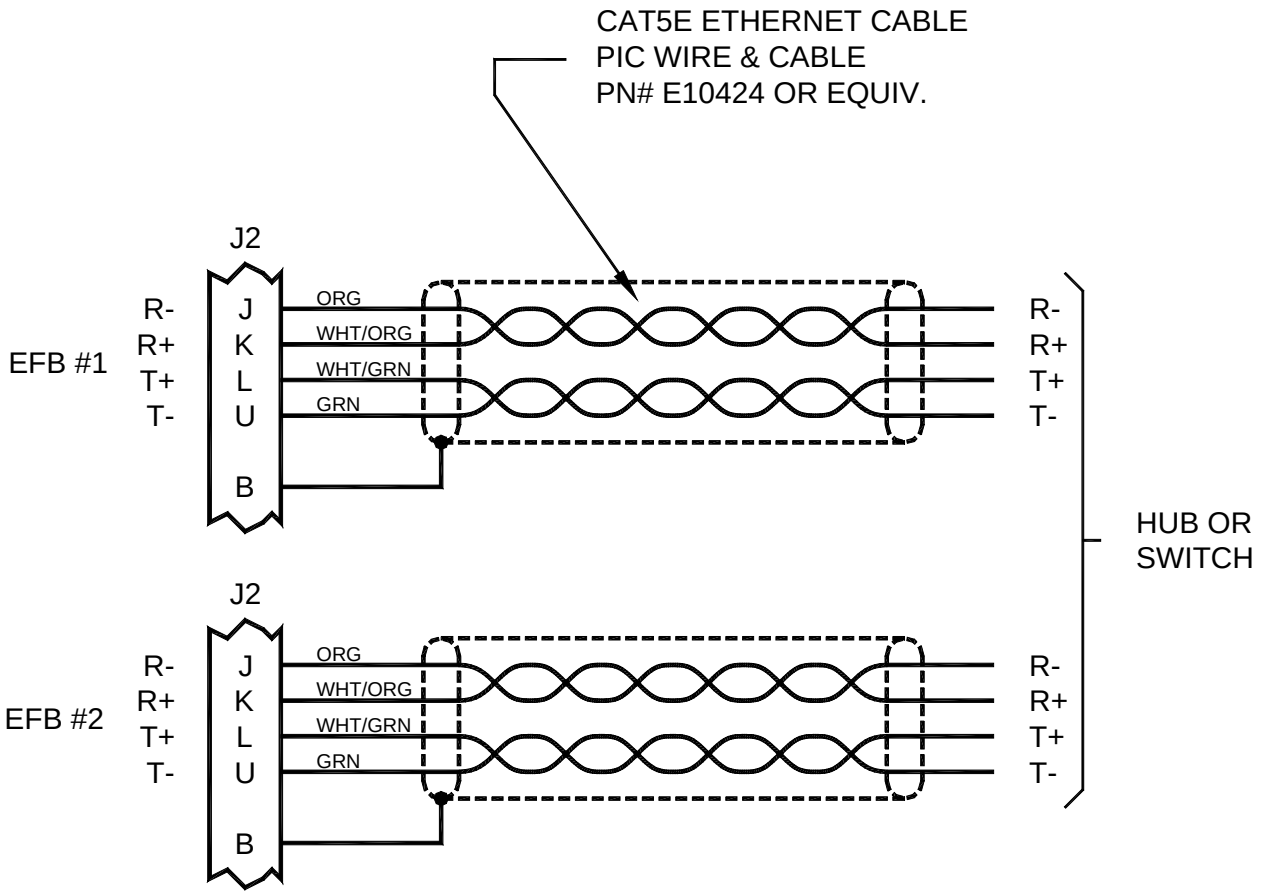
J3 VGA Connector

A	Red Common	VGA Red Common
B	Red	VGA Red
C	Green	VGA Green
D	Blue Common	VGA Blue Common
E	Green Common	VGA Green Common
F	Blue	VGA Blue
H	IDO	IDO
J	Video Ground	Video Ground
K	H- Sync	Horizontal Sync
L	ID1	ID1 or DDC Data
M	ID2	ID2
N	V-Sync	Vertical Sync
P	Sync Rtn	Sync Return
R	ID3	ID3 or DDC Clock

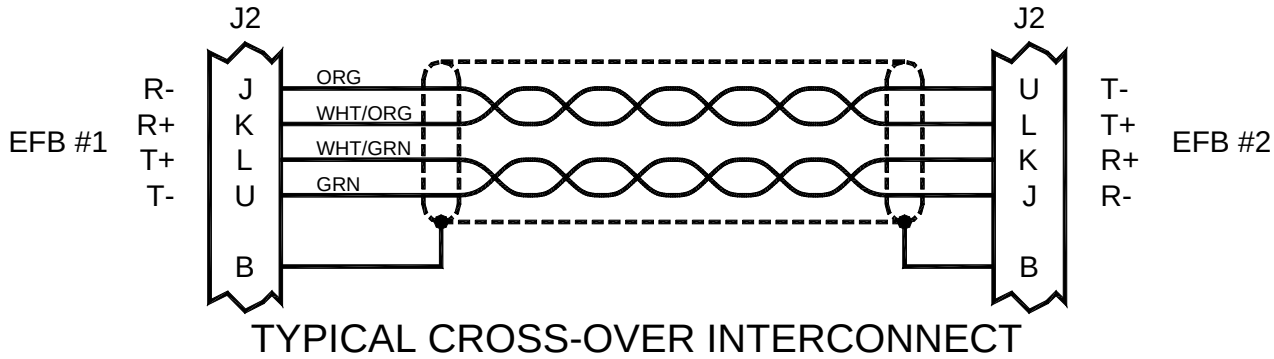
TYPICAL INTERCONNECT:



TYPICAL ETHERNET INTERCONNECTIONS:

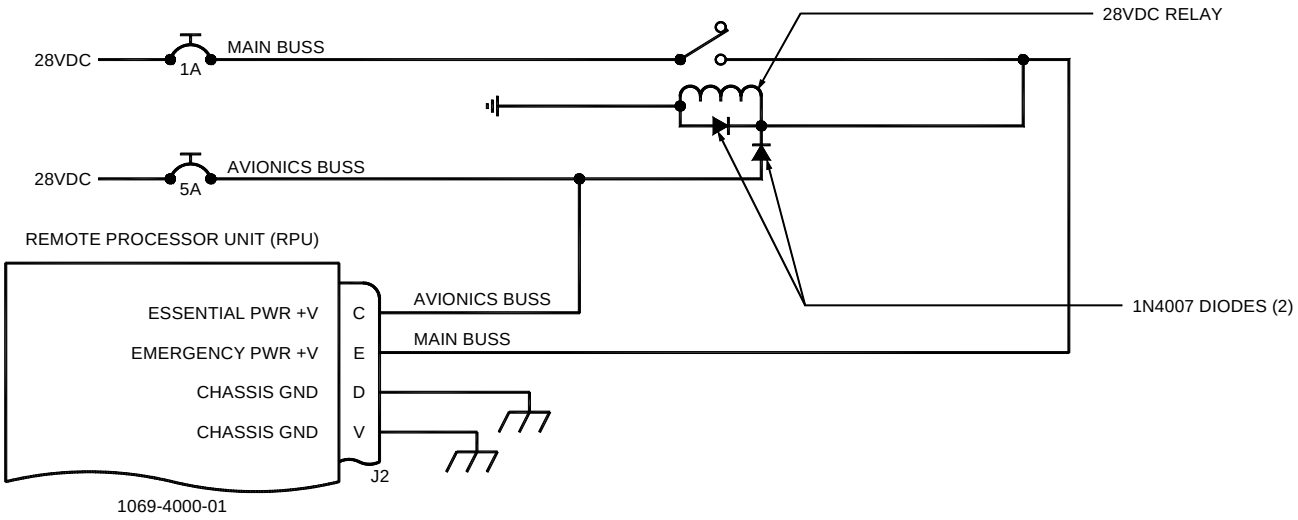


TYPICAL STRAIGHT-THRU INTERCONNECT



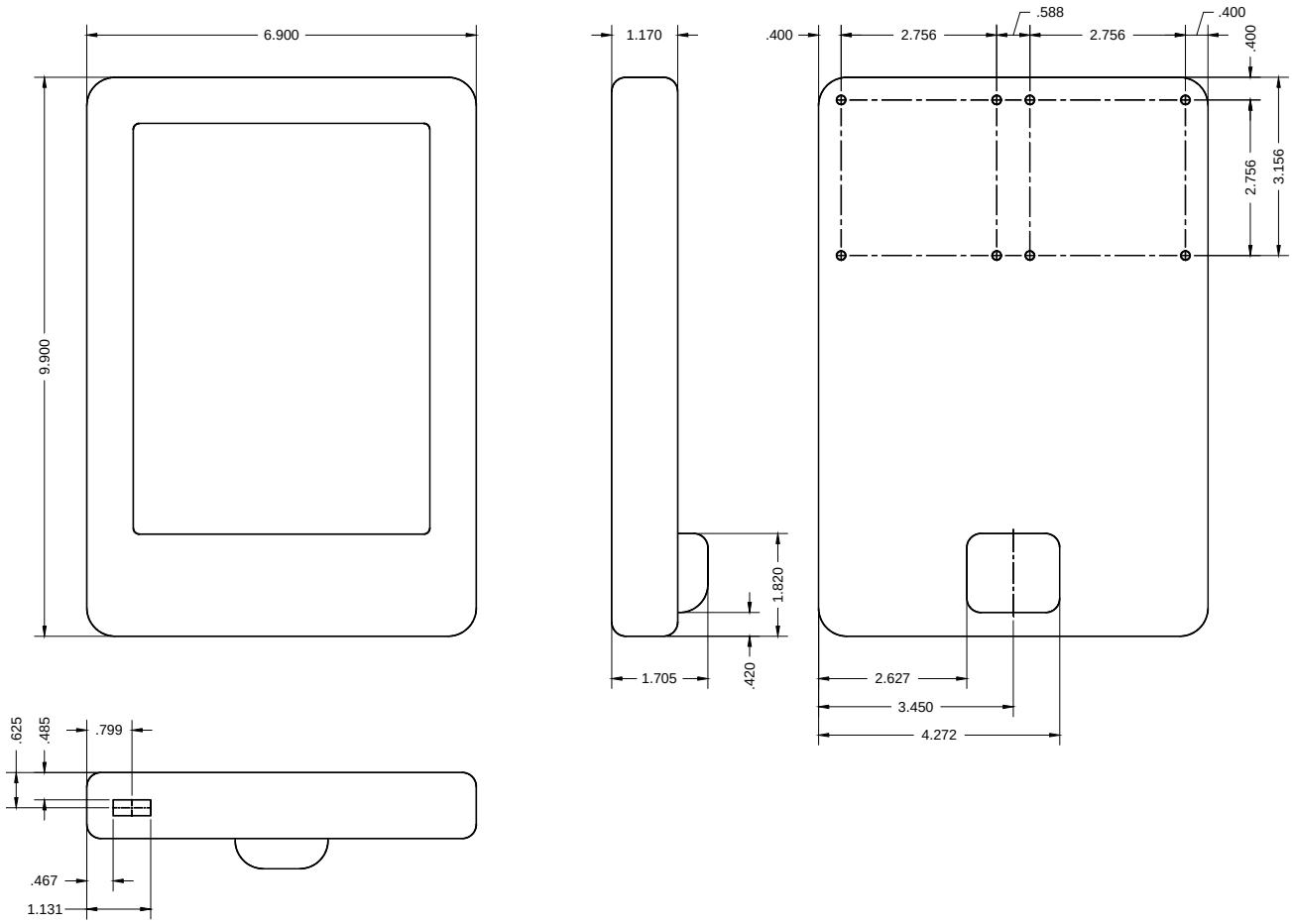
TYPICAL CROSS-OVER INTERCONNECT

INTERCONNECT FOR AIRCRAFT WITHOUT EMERGENCY BUSS:



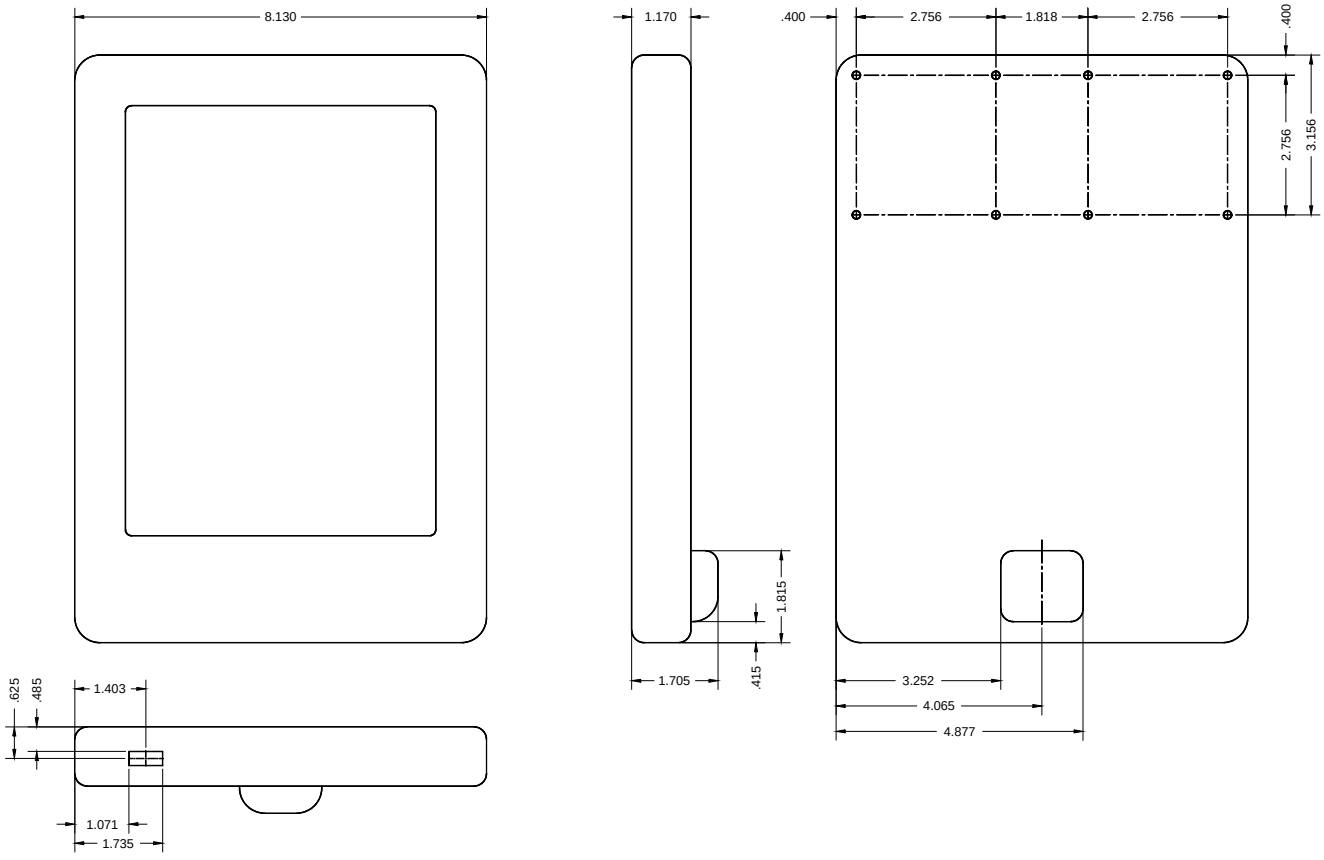
OUTLINE DRAWING:

I. 8 Inch Display Unit



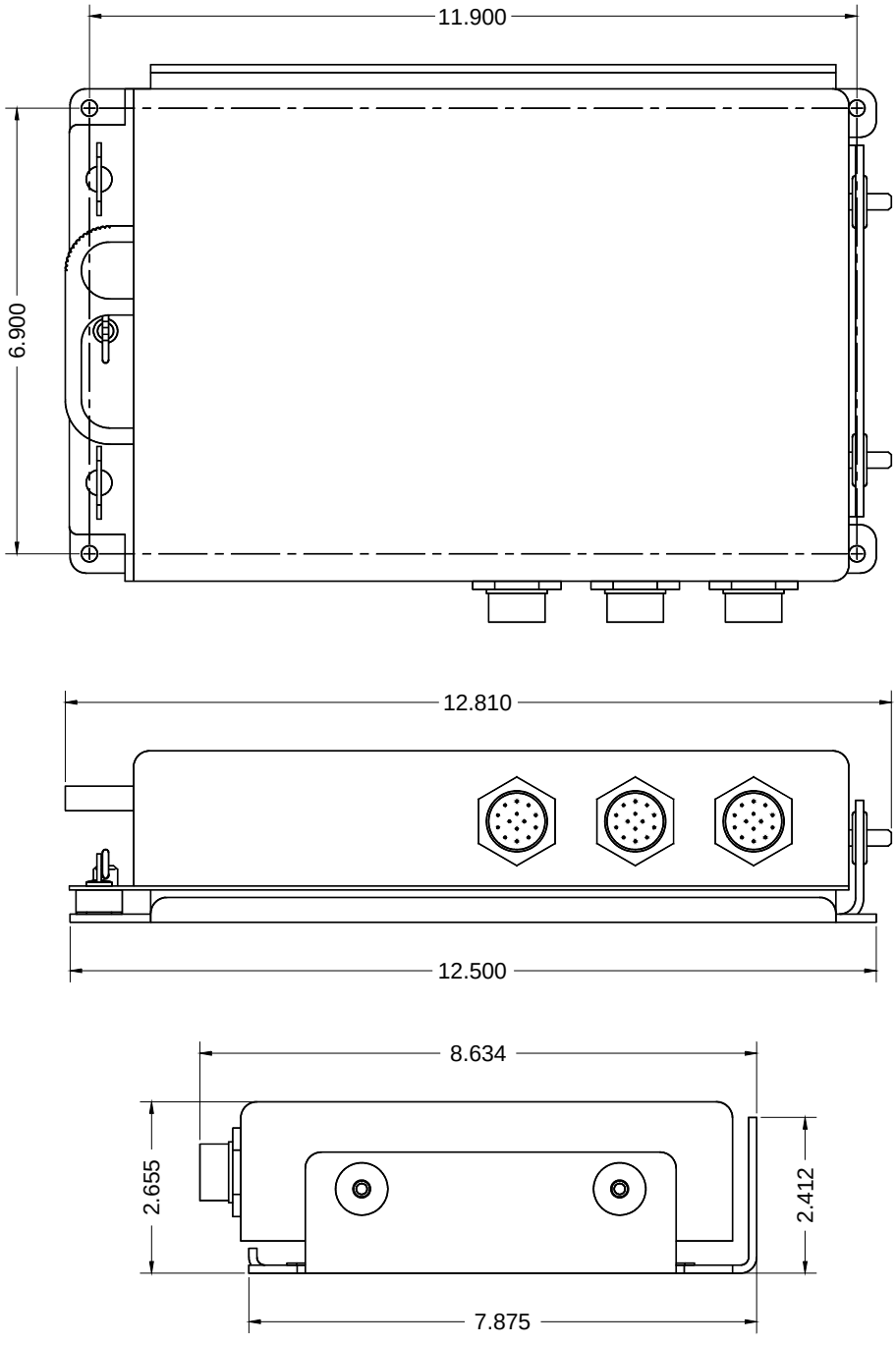
Note: Dimensions are in inches.

II. 10 Inch Display Unit



Note: Dimensions are in inches.

III. Remote Processor Unit in Mount



Note: Dimensions are in inches.